List of Contents

NUMBERS 1–2

PROCEEDINGS OF THE 21ST INTERNATIONAL CONFERENCE ON COMPUTERS AND INDUSTRIAL ENGINEERING

Sabah U. Randhawa 1 Editor's Note

TECHNOLOGY MANAGEMENT

Neslihan Alp, Birol Alp and **Yildirim Omurtag** 3 The influence of decision makers for new technology acquisition

Neslihan Alp, Birol Alp and **Yildirim Omurtag** 7 Technology acquisition and utilization model (TAUM)

Wieslaw Switek and **Tadeusz Majewski** 11 Dynamic modeling and optimization for technology management

INFORMATION SYSTEMS

W. Hernandez and **J. M. Rivera** 15 A production information system, an application in the pharmaceutical industry

Dinesh Dhamija, David A. Koonce and **Robert P. Judd** 19 Development of a unified data meta-model for CAD-CAPP-MRP-NC verification integration

Miguel-Angel Oros-Hernández 23 Symbolic optimization in an object-oriented database using constraints

David A. Koonce, Cheng-Hung Fang and **Shi-Chi Tsai** 27 A data mining tool for learning from manufacturing systems

Anwar-ul Islam 31 Derivation of selection criteria of CIM database using $IDEF_0$

Cheickna Sylla and **Michael R. Bartolacci** 35 A DSS methodology for the evaluation of ATM technologies

OPTIMIZATION

Mitsuo Gen, Kenichi Ida, Jaeuk Lee and **Jongryul Kim** 39 Fuzzy nonlinear goal programming using genetic algorithm

Nazario D. Ramírez-Beltrán and **Karina Aguilar-Ruggiero** 43 Application of an heuristic procedure to solve mixed-integer programming problems

Raymond G. Taylor	47	A general form for the capital projects sequencing problem
Alberto Garcia-Diaz and **Ahmet Kuyumcu**	51	A cutting-plane procedure for maximizing revenues in yield management
Mauricio Osorio and **Bharat Jayaraman**	55	Specification and computation of optimization problems
Nasser S. Fard	59	Determination of minimal cut sets of a complex fault tree
J. Xue and **K. K. Lai**	63	A study on cargo forwarding decisions
Miguel Vélez-Reyes and **George C. Verghese**	67	Parameter estimation using decomposed algorithms with fast convergence rates
Takao Yokota, Takeaki Taguchi and **Mitsuo Gen**	71	A solution method for optimal weight design problem of herical spring using genetic algorithms
		SIMULATION
Sabah Randhawa and **Chun-Ho Kuo**	77	Generating knowledge and decision expertise using simulation
Elsayed A. Orady, T. A. Osman and **Clark P. Bailo**	83	Capability study of robotics and manufacturing cell simulation software
Elsayed A. Orady, T. A. Osman and **Clark P. Bailo**	87	Virtual reality software for robotics and manufacturing cell simulation
Jianxin Jiao, Maode Ma and **Mitchell M. Tseng**	91	Simulation on a fault tolerant multiprocessor system
Carlos J. González, Merbil González and **Nilda M. Ríos**	97	Improving the quality of service in an emergency room using simulation-animation and total quality management
G. Allen Pugh	101	Fuzzy allocation of manufacturing resources
M. S. Eid, C. Moghrabi and **H. K. Eldin**	105	A simulation approach to evaluating quality/cost decision scenarios
O. Starostenko, A. Sanchez Aguilar and **S. Lobato**	109	Simulation facilities for RISC processors data flow and performance optimizations
		QUALITY CONTROL AND RELIABILITY
Ariel Sepúlveda and **Joel A. Nachlas**	113	A simulation approach to multivariate quality control

Prapaaisri Sudasna-na-Ayudthya and **Edward D. McDowell**	117	A comparison of two approaches to automating robust design
Jiangbin Yang and **Viliam Makis**	121	On the performance of classical control charts applied to process residuals
Felipe Llaugel and **Silverio Confesor**	125	Computer-aided statistical quality control learning
Kuo-Hsiung Wang and **B. D. Sivazlian**	129	Life cycle cost analysis for availability system with parallel components
Azim Houshyar and **Bahador Ghahramani**	133	A practical reliability and maintainability data collection and processing software
Evelyn Morales, Radamés Aguayo and **Juan C. Villa**	137	Manufacturing tracking system at Hewlett Packard Puerto Rico
Noel Artiles-León and **Javier Rodríguez-Reyes**	141	Optimization of Carborundum's gas igniter furnacing process using experimental design
Noel Artiles-León and **Francisco Mella-Cabrera**	145	Improvement of igniters' quality characteristics using experimental design
Denis Ridley	149	Antithetic lognormal/normal random variables

QUALITY MANAGEMENT

Rosalva Martínez and **J. Francisco Rodríguez**	153	Quality services model oriented to customers
Thomas J. Crowe, Krishnakant Rathi and **Joseph D. Rolfes**	157	Selecting business process reengineering projects strategically
Aysar Philip Sussan and **William C. Johnson**	161	The impact of market/quality orientation on business performance
A. C. J. van Rensburg	167	An object-oriented architecture for business transformation
José R. Deliz	171	Lessons learned from Baldrige winners
J. K. Banerjee	175	The gap management
Sharon D. Ramsey and **Celestine A. Ntuen**	179	SATORC: a system analysis tool for reengineering complex systems

HUMAN FACTORS ENGINEERING

M. L. Resnick and **A. Zanotti**	185	Using ergonomics to target productivity improvements

Samantha Wright	189	Validating a predictive model for computer icon development
Dara Strickland and **Celestine Ntuen**	193	The effects of personality on supervisory control tasks
Maranda E. McBride and **Celestine A. Ntuen**	197	The effects of multimodal display aids on human performance
Celestine A. Ntuen and **Jianhong Gong**	201	A computer simulation of human perception of color
Max A. Dixon, **Jose A. Alvarez**, **Jose Rodriguez** and **Julie A. Jacko**	205	The effect of speed reducing peripherals on motorists' behavior at pedestrian crossings
Kimberly Coley, **Samantha Wright**, **Eui Park** and **Celestine Ntuen**	209	Optimizing the usability of automated teller machines for older adults
Zulma R. Toro Ramos and **Marco A. Henrich Saavedra**	213	Anthropometric table for the Puerto Rican industrial population
Lesia L. Crumpton and **Edward L. Harden**	217	Using virtual reality at a tool to enhance classroom instruction

CELLULAR MANUFACTURING

Gürsel A. Süer and **Ivan Sánchez-Bera**	221	Common cell size determination and cell loading in labor-intensive manufacturing cells
Angel A. Cedeño and **Gürsel A. Süer**	225	The use of a similarity coefficient-based method to perform clustering analysis to a large set of data with dissimilar parts
Mitchell M. Tseng and **Jianxin Jiao**	229	A module identification approach to the electrical design of electronic products by clustering analysis of the design matrix
Rasaratnam Logendran and **Vimalin Puvanunt**	235	Duplication of machines and subcontracting of parts in the presence of alternative cell locations
Yannick Marcoux, **Jocelyn Drolet** and **Georges Abdulnour**	239	Studying the performance of a dynamic cellular manufacturing system
Adelina Castillo, **Hamid Seifoddini** and **Jeffrey Abell**	243	The development of a cellular manufacturing system for automotive parts

PRODUCTION SCHEDULING

O. Holthaus	249	Design of efficient job shop scheduling rules

C. H. Dagli and **K. Schierholt**	253	Evaluating the performance of the genetic neuro scheduler using constant as well as changing cross-over and mutation rates
Alex J. Ruiz-Torres, E. Emory Enscore and **Russell R. Barton**	257	Simulated annealing heuristics for the average flow-time and the number of tardy jobs bi-criteria identical parallel machine problem
Ebru Demirkol and **Reha Uzsoy**	261	Performance of decomposition methods for complex workshops under multiple criteria
W. Hernandez, J. M. Rivera and **I. Y. Alfonzo**	265	An alert mechanism for the release lateness
Ceyda Oğuz and **Fikret Ercan**	269	Scheduling multiprocessor tasks in a two-stage flow-shop environment
Grisselle Centeno and **Robert L. Armacost**	273	Parallel machine scheduling with release time and machine eligibility restrictions
Gürsel A. Süer, Francisco Pico and **Aidsa Santiago**	277	Identical machine scheduling to minimize the number of tardy jobs when lot-splitting is allowed
C. Rajendran and **H. Ziegler**	281	A heuristic for scheduling to minimize the sum of weighted flowtime of jobs in a flowshop with sequence-dependent setup times of jobs
D. L. Santos and **Anthony Heath**	285	An application of multiprocessor scheduling methods in the production of digital holographic images

MISCELLANEOUS IE APPLICATIONS

José Luis Pérez	289	TOC for world class global supply chain management
Merbil González-Martínez, José A. Borges, José Navarro, Néstor J. Rodríguez	295	An Automatic Resource Scheduling System (ARSS)
A. S. Anagun	299	Selecting inventory models using an expert system
Keytack H. Oh	303	Expert Line Balancing System (ELBS)
Masud Mansuri	307	Cycle-time computation, and dedicated storage assignment, for AS/R systems
B. S. Boardman, E. M. Malstrom, D. P. Butler and **M. H. Cole**	311	Computer assisted routing of intermodal shipments
Jorge L. Perez-Lafont	315	Installation of a T.P.M. program in a Caribbean plant

Mitchell M. Tseng and **Jianxin Jiao** 319 Case-based evolutionary design for mass customization

Surendra M. Gupta and **Jacqueline A. Isaacs** 325 Value analysis of disposal strategies for automobiles

Askiner Gungor and **Surendra M. Gupta** 329 An evaluation methodology for disassembly processes

José A. Cruz-Cruz 333 Professional staff coordination: support for staffing at professional service organizations

Nazario D. Ramirez-Beltran and **Jaime A. Montes** 337 Neural networks for on-line parameter change detections in time series models

COMPUTER-INTEGRATED MANUFACTURING

Charles M. Parks, David A. Koonce, Robert P. Judd and **Michael Johnson** 341 An integrated manufacturing systems design environment

Nanua Singh, S. Ding, R. Jagirdar and **E. A. Basil** 345 A knowledge engineering framework for rapid design

S. Motavalli, S. H. Cheraghi and **Rafie Shamsaasef** 349 Feature-based modeling; an object oriented approach

Parveen S. Goel and **Nanua Singh** 353 A modeling approach for integrating durability engineering and robustness in product design

M. Rico, O. Yuschak, M. L. Taverna, J. C. Ramos, M. R. Galli and **O. Chiotti** 357 Decision support systems generator for industrial companies

MANUFACTURING—ELECTRONICS

Bernard Cyr, Serge Lambert, Georges Abdul-Nour and **René Rochette** 361 Manufacturing flexibility: SMT factors study

Enrique Guerra, Alfonso Manriquez, Daniel Schwartz and **J. Rene Villalobos** 365 Three dimensional automated visual inspection of surface mounted devices

Serge Lambert, Bernard Cyr, Georges Abdul-Nour and **Jocelyn Drolet** 369 Comparison study of scheduling rules and set-up policies for a SMT production line

David Enke and **Cihan Dagli** 373 Automated misplaced component inspection for printed circuit boards

Y. Y. Su, K. Srihari and **C. R. Emerson**	377	A profile identification system for surface mount printed circuit board assembly
D. L. Santos, Rajkumar B. Raj, Molly Lane, David Sissenstein and **Michael Testani**	381	Defect reduction in PCB contract manufacturing operations
Lisa Rielly, K. Srihari and **Jude Dilella**	385	A systematic evaluation of adhesive deposition for mixed technology PCB assembly
Héctor I. Espada Colón and **David R. González-Barreto**	389	Component registration diagnosis for printed circuit boards using process-oriented basis elements
Octavian Nicolio	393	Numerical computations on the m-resistor trimming problem

MANUFACTURING—MECHANICAL

C. Acosta, W. Switek and **E. Garcia**	397	Dynamic modeling in turning machining
S. J. Lou and **J. C. Chen**	401	In-process surface recognition of a CNC milling machine using the fuzzy nets method
W. Hernandez and **V. J. Leon**	405	An overview of the operations analysis of a two-head flexible assembly machine with interference avoidance
Yuan-Shin Lee and **Dhaval Daftari**	409	Process planning and machining of generic virtual pockets by feature-composition approach

MANUFACTURING CONTROLS

G. Sun, C. H. Dagli and **A. Thammano**	413	Dynamic neuro-fuzzy control of the nonlinear process
Nazario D. Ramirez-Beltran	417	Transfer function models to control a chemical process
Agustín Rullán	421	Programmable logic controllers versus personal computers for process control
Ricardo Moncada V., Carlos Pavone, José Ferrer S. and **Manuel Vera**	425	A multi-purpose real-time man–machine interface for control systems laboratory

IMAGE PROCESSING

J. B. Bosch and **E. M. Ehlers**	429	Remote sensing of characters on 3D objects

Wendolin Bosques, Ricardo Rodríguez, Angélica Rondón and **Ramón Vásquez** 433 A spatial data retrieval and image processing expert system for the World Wide Web

Hamed Parsiani and **Ricardo Garcia** 437 Analysis of iterated block matching fractals for image compression

Hamed Parsiani and **William Navas** 441 Analysis of iterated function system fractals for image compression

V. Manian and **R. Vásquez** 445 Feature analysis for scaled and rotated texture segmentation

R. Singh, R. Singh and **R. Vásquez** 449 ML parameter estimation and minimum distance classifier for texture analysis using wavelet transform

NUMBERS 3-4

SELECTED PAPERS FROM THE PROCEEDINGS OF 1996 ICC&IC

ARTIFICIAL INTELLIGENCE/NEURAL NETWORKS

Sungzoon Cho, Min Jang, Sungcheol Yoon, Yongjoong Cho and **Hyungsuk Cho** 453 A hybrid neural-network/mathematical prediction model for tandem cold mill

Inho Jang and **Jongtae Rhee** 457 Generalized machine cell formation considering material flow and plant layout using modified self-organizing feature maps

Steven H. Kim and **Churl Min Lee** 461 Nonlinear prediction of manufacturing systems through explicit and implicit data mining

Yinzhen Li, Kenichi Ida, Mitsuo Gen and **Reiko Kobuchi** 465 Neural network approach for multicriteria solid transportation problem

Inkap R. Song, Taeyong Yang and **Jacob Jen-Gwo Chen** 469 Enhanced exchange heuristic based resource constrained scheduler using ARTMAP

Abdolhamid Torki, Samerkae Somhon and **Takao Enkawa** 473 A competitive neural network algorithm for solving vehicle routing problem

Yasuhiro Tsujimura, Mitsuo Gen and **Syunsuke Ishizaki** 477 Optimal routing in multiple I/O data network using neural network with perturbed energy function

CAD/CAM/CAPP

Y. H. Chen and **C. T. Ng**	481	Integrated reverse engineering and rapid prototyping
S. K. Cheng and **K. P. Rao**	485	Quick and precise clustering of arbitrarily shaped flat patterns based on stringy effect
Ajay Joneja	489	Geometric reasoning for optimizing backward growing-based feature recognition
Jaekoo Joo, Hyunbo Cho and **Wonsoo Yun**	493	Efficient feature-based process planning for sculptured pocket machining
N. K. Kim, Y. Kim and **S.-H. Kang**	497	Subdivision methods of converting STEP into VRML on Web
Yong Se Kim, Youngjin Kim, Frederic Pariente and **Eric Wang**	501	Geometric reasoning for mill-turn machining process planning
Y. M. Kyoung, K. K. Cho and **C. S. Jun**	505	Optimal tool selection for pocket machining in process planning
M. A. Younis and **M. A. Abdel Wahab**	509	A CAPP expert system for rotational components

ERGONOMICS

Yves Beauchamp, Marc Thomas, Jean Arteau and **Denis Marchand**	513	Psychophysical measurements as an effective way of evaluating climbability of wood treated utility poles
DooWon Cha and **Peom Park**	517	User required information modality and structure of in-vehicle navigation system focused on the urban commuter
Min K. Chung and **Kyungim Choi**	521	Ergonomic analysis of musculoskeletal discomforts among conversational VDT operators
Dohyung Kee and **Sang Ho Kim**	525	Analytic generation of workspace using the robot kinematics
Byoungju Kim, Sung H. Han, Keewon Nam, Jaeho Park and **Seungah Han**	529	Presenting map information on a global positioning system
Gene C. H. Lee, Younghak Yoo and **Sherrie Jones**	533	Investigation of driving performance, vection, postural sway, and simulator sickness in a fixed-based driving simulator

FLEXIBLE MANUFACTURING SYSTEMS

Pyung-Hoi Koo, J. M. A. Tanchoco and **Joseph J. Talavage**	537	Tool requirements in manufacturing systems under dynamic tool sharing

Dong-Ho Lee, Seung-Kil Lim, Geun-Cheol Lee, Hong-Bae Jun and **Yeong-Dae Kim** 541 Multi-period part selection and loading problems in flexible manufacturing systems

Rasaratnam Logendran and **Chang Seong Ko** 545 Manufacturing cell formation in the presence of flexible cell locations and material transporters

Hosub Shin, Jeongho Park, Choonghwa Lee and **Jinwoo Park** 549 A decision support model for the initial design of FMS

FUZZY SET THEORY AND APPLICATIONS

Mitsuo Gen, Yasuhiro Tsujimura and **Dazhong Zheng** 553 An application of fuzzy set theory to inventory control models

Jung Bok Jo, Yasuhiro Tsujimura, Mitsuo Gen, Genji Yamazaki and **Jae Uk Lee** 557 Performance of multiclass BCMP model for computer system based on fuzzy set theory

Y. J. Ju, C. E. Kim and **J. C. Shim** 561 Genetic-based fuzzy models: interest rate forecasting problem

Shin'ya Nagasawa 565 Application of fuzzy theory to value engineering

HanSuk Pan and **WonYoung Yun** 569 Fault tree analysis with fuzzy gates

GENETIC ALGORITHMS

N. W. Cho, N. K. Kim, Y. Kim and **S.-H. Kang** 573 An evolutionary method for general surface-surface intersection problems

Dijin Gong, Mitsuo Gen, Genji Yamazaki and **Weixuan Xu** 577 Hybrid evolutionary method for capacitated location-allocation problem

B. M. Kim, Y. B. Kim and **C. H. Oh** 581 A study on the convergence of genetic algorithms

Yinzhen Li, Kenichi Ida and **Mitsuo Gen** 589 Improved genetic algorithm for solving multiobjective solid transportation problem with fuzzy numbers

W. Y. Liang and **Peter O'Grady** 593 Genetic algorithms for design for assembly: the remote constrained genetic algorithm

Takeaki Taguchi, Kenichi Ida and **Mitsuo Gen** 597 Method for solving nonlinear goal programming with interval coefficients using genetic algorithm

IE APPLICATIONS

Akihide Hiura, Toshiya Kuroda, Nobuhiro Inuzuka, Ken-ichi Itoh, Masashi Yamada, Hirohisa Seki and **Hidenori Itoh** — 601 Cooperative behavior of various agents in dynamic environment

Keun-Chae Jeong and **Yeong-Dae Kim** — 605 Algorithms for determining capacities of individual buffers in assembly/disassembly systems

Shigeo Kato — 609 Simulation of a gas–liquid phase-change micro-actuator

Cheol-Shin Kwon and **Keun-Tae Cho** — 613 An estimation model for completion times considering the time interval between interdependent R&D events

M. L. Manjunath, V. M. Rao Tummala and **Kevin Cox** — 617 A decision support system model in estimating budgets for standard figure tools at Mattel Toys

H. S. Mok, H. J. Kim and **K. S. Moon** — 621 Disassemblability of mechanical parts in automobile for recycling

Tadashi Takemae, Masahiro Ito and **Seiya Murase** — 625 Parallel processing circuit of line image using Neuristor

Mitchell M. Tseng and **Jianxin Jiao** — 629 A variant approach to product definition by recognizing functional requirement patterns

Ichida Yozi — 635 Computer networks and interfirm relationships in the automobile industry: a comparative study of Japan and Korea

INFORMATION SYSTEMS

Toshinori Chikara and **Takenori Takahashi** — 639 Research of measuring the customer satisfaction for information systems

N. C. Do, S. M. Bae and **I. J. Choi** — 643 Constraint maintenance in engineering design system: an active object-oriented approach

Gilsang Jang and **Heeseok Lee** — 649 File and workload allocation design for distributed database on a two-level local multi-access computer network

Hee-Ryn Jang, Toyokazu Nose, Sennosuke Kuriyama and **Yasuo Adachi** — 653 Cost management system based on EUC concept

Dong-Ha Lee, Su-Woong Kim, Gabrielle Methou and **Jeon-Young Lee** 657 Search for the blind: a schema independent query method using concept hierarchy and keywords

De-Li Yang and **Xiaotong Wang** 661 An approach to unify model definition and manipulation

MATERIAL HANDLING

Ying-Chin Ho and **Colin L. Moodie** 665 Locating I/O points of flexible manufacturing cells with the consideration of within-cell and inter-cell flow distance

Kap Hwan Kim and **Jae Yeon Kim** 669 Estimating mean response time and positioning idle vehicles of automated guided vehicle systems in loop layout

Ki Young Kim and **Kap Hwan Kim** 673 A routing algorithm for a single transfer crane to load export containers onto a containership

Norio Yamaguchi and **Kazuhiro Shimoda** 677 An operation analysis of movable rack type AS/RS by use of system simulator

OPTIMIZATION/MATHEMATICAL PROGRAMMING

Geun-Sik Jo, Ken McAloon and **Carol Tretkoff** 681 Modern modeling of a classic multiperiod problem

Daeki Kim and **Cynthia Barnhart** 685 Multimodal express shipment service design: models and algorithms

Si-Hwa Kim and **Kyung-Keun Lee** 689 An optimization-based decision support system for ship scheduling

Ojeong Kwon, Kyungsik Lee and **Sungsoo Park** 693 Targeting and scheduling problem for field artillery

Chiun-Ming Liu 697 Network dual steepest-edge methods for solving capacitated multicommodity network problems

PRODUCTION PLANNING AND INVENTORY MANAGEMENT

Heung-Suk Hwang 701 A study on an inventory model for items with Weibull ameliorating

Hiroshi Katayama, Jun Nakazato, Seiji Ishikawa and **Masayoshi Ishii** 705 Some advanced semiconductor production-inventory management systems and their performances

Kyung K. Lee and **Young S. Kim** 709 Price-based buffer sizing in assembly systems

Youngsu Lee, Sooyoung Kim, Seunghee Yea and **Bokang Kim**	713	Production planning in semiconductor wafer fab considering variable cycle times
S. W. Shinn	717	Determining optimal retail price and lot size under day-terms supplier credit
Gürsel A. Süer	721	Minimizing the number of tardy jobs in multi-period cell loading problems
Ken Takeda and **Mitsuru Kuroda**	725	Analysis of multi-stage production/inventory system with an acceptable response time
Yeong-joon Yoo, Won-seok Kim and **Jong-tae Rhee**	729	Efficient inventory management in multi-echelon distribution systems

RELIABILITY AND QUALITY MANAGEMENT

O. O. Atienza, L. C. Tang and **B. W. Ang**	733	ARL properties of a sample autocorrelation chart
Sanghoon Lee and **Sungwoon Choi**	737	Adaptive process monitoring using scale CUSUM for serially correlated processes
So Young Sohn	741	Bayesian dynamic forecasting for attribute reliability
Shigeru Yanagi, Kazunari Hasegawa and **Tetsushi Yuge**	745	An approximation to the steady state probabilities of a multi-echelon repair model for a series system
Masaaki Yonezawa and **Shoya Okuda**	749	Structural reliability assessment based on directional vector approximation method
Wang-Jin Yoo and **Kyung-Hee Jung**	753	Mission reliability of an automatic control system integrated with distributed intelligent built-in-test systems

SCHEDULING

Jun-Geol Baek, Jong-Kwan Baek and **Sung-Shick Kim**	757	A batch scheduling scheme for the workcenter that supplies parts to a mixed-model assembly line
Runwei Cheng and **Mitsuo Gen**	761	Parallel machine scheduling problems using memetic algorithms
K. Choi, S. Kim, H. Lee, I. Kwon	765	An operation scheme for make-to-order job-shop production systems
Wonjoon Choi and **Hyunoh Shin**	769	A real-time sequence control system for the level production of the automobile assembly line

Hark Hwang and **Ji Ung Sun** 773 Production sequencing problem with reentrant work flows and sequence dependent setup times

B. J. Jeong 777 Evaluation of assembly sequences using generalized flexible assembly systems scheduling problem

Hanil Jeong, Sangbok Woo, Sukho Kang and **Jinwoo Park** 781 A batch splitting heuristic for dynamic job shop scheduling problem

Kap Hwan Kim, Jun Yeob Song and **Ki Hong Wang** 785 A negotiation based scheduling for items with flexible process plans

Joon-Mook Lim 789 A genetic algorithm for a single hoist scheduling in the printed-circuit-board electroplating line

Moon-Won Park and **Yeong-Dae Kim** 793 Search heuristics for a parallel machine scheduling problem with ready times and due dates

Sungyeol Yu, Jinhyeon Sohn, Sungsoo Park and **Byung Jun Oh** 797 Efficient operation of a multi-functional surface mounting device

STOCHASTIC MODELING AND SIMULATION

X. N. Hu, L. C. Tang and **H. L. Ong** 801 A $M/D^X/1$ vacation queue model for a signalized intersection

Young-Hae Lee, Kyou-Hyung Kyung and **Chang-Sik Jung** 805 On-line determination of steady state in simulation outputs

Koichi Nakade and **Katsuhisa Ohno** 809 Stochastic analysis of a U-shaped production line with multiple workers

Yasuhide Shinohara, Tadashi Dohi and **Shunji Osaki** 813 Comparisons of optimal release policies for software systems

Loon C. Tang and **Ek-Peng Chew** 817 Order picking systems: batching and storage assignment strategies

TELECOMMUNICATION

Jang-Hyun Baek, Bok-Sik Yoon and **Chang-Hoon Lie** 821 Analysis of delay distributions in CDMA mobile switching system

J. Hahm, W. Chu and **J. W. Yoon** 825 A strategic approach to customer satisfaction in the telecommunication service market

Duk Bin Jun, Seon Kyoung Kim, Myoung Hwan Park, Yoon Seo Park, Jae Ho Juhn, Chin Kyooh Lee and **Young Jin Joo** 829 Classification, relationships and forecasting models for telecommunication services

Kyeongtaek Kim, Kwangman Park and **Seungwoo Seo** 833 A matrix approach for telecommunications technology selection

Yeo Keun Kim, Jae Yun Kim and **Sung Soo Kang** 837 A tabu search approach for designing a non-hierarchical video-on-demand network architecture

Deok-joo Lee, Hiroshi Katayama and **Hyung-sik Oh** 841 Vertical integration in the telecommunication market

TRANSPORTATION

Rakhmat Ceha and **Hiroshi Ohta** 845 Prediction of future origin destination matrix of air passengers by fratar and gravity models

J. J. Langerman and **E. M. Ehlers** 849 Agent-based airline scheduling

Yang-Byung Park and **Sung-Hun Song** 853 Vehicle scheduling problems with time-varying speed

M. L. Zarrillo, A. E. Radwan and **H. M. Al-Deek** 857 Modeling traffic operations at electronic toll collection and traffic management systems